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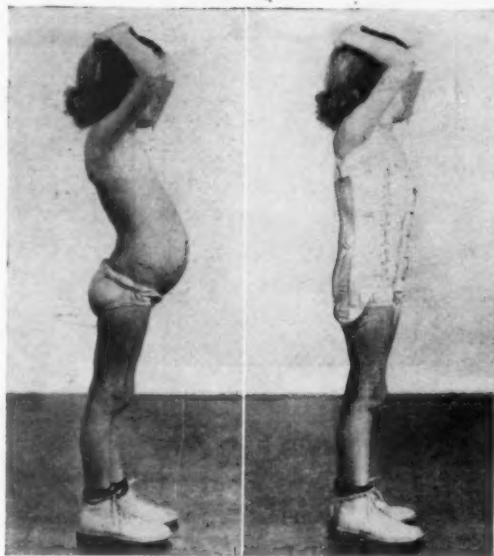
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ST. BARTHOLOMEW'S



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LECTURES

Taking the overall view, the standard of lectures at Bart.'s is poor. We have, of course, notable exceptions, and it is not the high standard of these few but the general level that leaves so much room for improvement.

It is interesting to know by what means the hospital magnate becomes eligible for his Rolls-Royce and chauffeur, and acquires the power of tyranny for three quarters of an hour over the minds of a somewhat variable number of students. To begin with, he practically must be a Bart.'s man. Excepting the Dental Department, there are only twelve of a clinical staff of sixty from outside hospitals. One-third are from Oxford and Cambridge, the majority of these from the latter. He must have served his time in subordinate posts, the length of time varying with his ability and with luck—the applicant's geographical position at the moment of a post becoming vacant having considerable importance. The official procedure is that notice of a vacancy on the Staff must be published in two medical journals, and applications submitted to an Advisory Appointments Committee consisting of seven members, five appointed by the Hospital and two by the University of London. The percentage of Bart.'s men on the Staff is thus explained.

Thus are our lecturers chosen, as in all scientific institutions, for their technical rather than their rhetorical ability. The requirements of a good speaker are few and readily attained, yet it is disturbing to see

how often these elementary criteria are neglected. He must speak slowly, clearly and loud enough for the backbenchers to hear. He should avoid mannerisms—we have our quota at Hospital. The pointer at the empty blackboard, the chalk adjuster, the bashful, facing directly away from his audience, the recumbent, the peripatetic, the moustache stroker, the juggler, all pursue their foibles enthusiastically.

The good speaker must present his subject in an intelligible framework, capable of interpretation by those most voracious of note takers, the ladies. Lecture notes help towards this end, but defeat their purpose if merely read. If he can produce jokes that are funny, so much the better, but it is as well to remember that nothing falls so flat as a poor joke at half past five of a summer evening. The reading of previously issued précis makes for the dullness of all lectures. A few slides, however irrelevant, always enliven a talk, not to mention the value of a few minutes of darkness for readjustment in the numbers of the back bench population. Above all, let him not exceed the recognised time limit. Finally there is that something that will always distinguish the orator from the mere lecturer—that gift of the gab, that drop of Irish blood that can convert a talk on sanitary science into an hour's sheer fascination.

Appreciation of a lecturer varies directly with the convenience of the accommodation—it is not surprising that attention wanders in our present apology for a lecture theatre.

A flickering mercury vapour lamp during a hot evening must have acted as the trigger mechanism for more than one psychosis.

There is, however, a general delusion among students that all lectures are compulsory in spite of numerous statements to the contrary by the Dean. Certain lectures are considered compulsory by the examining bodies—to wit, Practical Pharmacy, Public Health, Forensic Medicine and Mental Diseases. Other than these there is no element of compulsion whatsoever. It is due to this misconception that the disgraceful scenes occur of mass emigrations with each lantern slide, and of lecturers having to order the more loquacious of their audience from

the room. If these students knew that their presence serves merely to harass the speaker and those who come to listen, and that their coveted "sign-up" is worth exactly nothing, they might have the courtesy to spend a little more time at Lord's.

There is much, then, that could readily be improved in the standard of our lectures—let there be a rhetorical Means Test before appointment to the Staff, let speakers take more care over their material and delivery, let there be a modicum of comfort in the theatre, and finally let there be an atmosphere of attention and scholarly calm during those few lectures that we do attend.

VISIT OF H.R.H THE DUCHESS OF GLOUCESTER



H.R.H. The Duchess of Gloucester visited St. Bartholomew's Hospital on the afternoon of May 23, 1950, and inaugurated the new Outpatient Trolley Service presented by the Ladies' Guild. She was presented with a bouquet by Miss Juliette Franklin, aged six. After the inauguration she visited Harmsworth, Dalziel and Martha Wards, and inspected the exhibition of Ladies' Guild needlework in the Great Hall.

HIGH AND LOW OUTPUT HEART FAILURE - A CRITICAL NOTE

By GEOFFREY BOURNE

When language places neatness before exactness of definition, confusion of thought is apt to follow. Phrases such as "hyperglycaemic coma" and "hypoglycaemic coma" have a meretricious balance which is very apt to deceive the mind. Coma always follows a sufficient degree of hypoglycaemia and never follows hyperglycaemia at all. A similar desire for terminological slickness is seen in the classification of heart failure into the two groups, high and low output failure.

When the heart muscle fails or when the heart for some other reason is unable to maintain its proper output of blood, the signs and symptoms of heart failure will follow. Thus the term "low output failure" indicates that as a result of heart failure the efficiency of the heart is diminished. High output, however, never is, never has, and never will be a result of heart failure. It is this difference in the basic meaning of the terms which leads to mental confusion and makes them hard to explain and to understand.

The matter can best be illustrated by thinking first of a patient who has a diminished cardiac output from myocardial disease. Whereas the cardiac output in a normal resting adult is in the neighbourhood of three to four-and-a-half litres per minute, this figure is increased six or seven times at least from vigorous exercise. When myocardial insufficiency has occurred, the effect of this same increase in exercise, even although the output rises only to three or four times the resting level, may be to bring on first the symptoms and later the physical signs of heart failure, both symptomatic and later congestive. If such an individual is forced by circumstances to keep up and about and to do work which increases the output above a critical figure, swelling of the feet, legs, thighs, and the other manifestations of congestive heart failure will occur, although the output during such exercise is obviously considerably increased above the resting figure. A picture analogous to this is produced in the condition described by the spuriously attractive term "high output failure." In such a case there is a cause present which increases the cardiac activity even although the patient is at rest, and simultaneously there is present a factor which has a deleterious effect upon the

health and physical state of the heart muscle. The result is thus two-fold, an increased cardiac output, and the symptoms and signs of heart failure.

Conditions Causing "High Output Failure"

There are three clinical groups of cases in which this sequence of events is commonly found. Patients with a sufficiently profound degree of *anæmia*, even at rest, can be proved by laboratory processes to have a much increased cardiac output. The physical signs of this are also present in many such cases. The heart rate is increased, the vigour of the heart beat is also increased, there is an exaggerated pulsation of the peripheral veins and sometimes of the arteries, and the whole impression of the patient suggests someone who has recently ceased from fairly vigorous exercise. Furthermore, post mortem examination of nearly every sufficiently anæmic patient shows that the heart is afflicted by hyaline and fatty degeneration of the muscle. Clinically the signs of heart failure are quite common in such patients.

A second group is that in which the lack of oxygen is produced, not by a deficiency in the blood, but by an insufficiency of the respiratory mechanism. Severe emphysema, chronic bronchitis, an extreme degree of pulmonary fibrosis, all these and similar conditions which interfere with lung function, will produce what is called *cor pulmonale*, either in an acute or a chronic form. *Cor pulmonale* is the second large group of cases in which the activity of the heart is stimulated to a level above normal, even although the patient may be at rest, and in this condition, too, lack of oxygen intake is apt to interfere with the health of the heart muscle. In such patients signs of congestive failure will appear even earlier, being due to the enforced increased activity of the diseased heart.

The third common clinical example of an increased circulation rate, both at rest, and of course all the more during exercise, is that of *thyrotoxicosis*. Here the increased cardiac activity is a result of the raised basal metabolic rate; and the effect of this factor upon the heart is accentuated by the probable action of thyroxin upon the heart muscle. It is a matter of belief rather than proof that thyroxin has such an effect, but

I have seen a case in which I believe this to have been proved. The patient was an extremely healthy woman in her forties, a very vigorous housewife with also a busy profession. Her holidays were as vigorous as her ordinary life. Having previously examined her from time to time and found her perfectly healthy, she suddenly developed auricular fibrillation as a result of taking tablets which contained thyroid extract to reduce her weight. The tablets were stopped, the fibrillation was banished, and fifteen years after she remains equally vigorous and well. The heart remains normal in size and shape radiologically, and the cardiogram is normal also.

Conclusions

In what is sometimes called "high output failure," the high output is the cause of the failure, whereas in low output failure the low output is the result of the failure. It is therefore better to keep to exact terms expressing exact thoughts than to make neat clichés do inaccurate work for a lazy cerebrum. There is no objection to describing the heart in anæmia, in thyrotoxicosis, and in chronic lung disease as suffering from a high output; but when such a heart fails its output falls in relation to the output necessary to keep such a patient free from failure. Thus in both types failure is associated with an output which is lower than that present before failure supervened.

The chief reason for the introduction of these terms into clinical medicine is that it is alleged that whereas digitalis has a most beneficial action in low output failure, that is to say in the vast majority of all cases of heart failure following myocardial and

valvular lesions, in high output failure this effect may be deleterious. The theoretical reason for this deduction is that in so far as digitalis lowers venous pressure it will beneficially relieve the over-distention of the right heart, so often present in severe low output failure. On the other hand, this lowering of the venous pressure in high output failure will prevent adequate diastolic auricular stretching, so that the heart will fill inadequately, and the output from the left ventricle will fall, thus accentuating the symptoms of failure. This pharmacological thesis does not always hold good. The lowering of the venous pressure is by no means the only action of digitalis, and it has only been proved, by experiment in the human being, to occur for a period of half to one hour after the intravenous injection of digoxin. Whether it persists longer is unknown. In addition to this action the drug certainly lowers the heart rate by reducing the conductivity of the Bundle of His in auricular fibrillation, and it also has in many cases a definite effect on the strength of the ventricular muscle.

A further reason for the unreliability of the theoretical rule is that the aetiology of cases of cor pulmonale and thyrotoxicosis is frequently a mixed one. Examples of pure right heart failure are thus comparatively rare; there is so often in addition evidence of left ventricular disease. Therefore in individual patients predominantly suffering from right heart failure digitalis cannot be sweepingly excluded as a useful drug. Aminophylline, oxygen inhalation, and the mercurial diuretics should be tried first. If there is then no improvement digitalis should be given without hesitation.

TO BROWNEYES

Those wondrous eyes, now lit by elfin grin;
Now, open window to the soul within,
So soft with pity for another's pain;
Or, shyly smiling, happy once again,
Full-charged with love and joyous giving;
Now sweetly gentle in a quick forgiving;
Now flashing fiery sparks—rage, scorn, or pride—
Such as Vulcan struck on Mount Olympus' side
Fashioning the armour of the God of War.
Not twice a thousand tongues nor many more
Had made you eloquent as those twin gems
From whose soft brown lustrous beauty stems
The lovely innocence and lack of guile
That light your laughter and your smile.

DAN WOODING.

THE CEREBRAL CORTEX AND THE AUTONOMIC NERVOUS SYSTEM

By D. A. MACDONALD

It is well established that the autonomic nervous system, in spite of the independence implied by its name, is under central nervous control. Early work on this was done by Karplus and Kreidl who, in 1910, described a "sympathetic centre" in the posterior hypothalamus, and later Beattie (about 1930) reported a "parasympathetic centre" in the anterior hypothalamus. Hess, in the meantime, had begun, in 1924, that long series of stimulation experiments, in both conscious and anesthetized animals, in which he showed the controlling influence of the hypothalamus for regulation both of the circulation and of respiration and other autonomic functions, and for which he was awarded a half share of the Nobel prize for physiology and medicine in 1949. It was also in the 1930s that Ranson and his associates in Chicago produced much confirmatory evidence, and in particular elucidated the rôles of the hypothalamus in regulating the secretion of anti-diuretic hormone, and in co-ordinating temperature control mechanisms in warm-blooded animals.

While the importance of the diencephalon for the nervous control of the viscera is generally accepted, the possibility of the cerebral cortex playing a part is much more controversial. This doubt possibly arises from the association in our minds of the cortex with willed movements and consciously controlled activities, while the normal regulation of the viscera is not subject to voluntary modification. Yet a moment's thought is enough to show that things that stimulate the cortex can have marked visceral effects. The sight of a pretty girl that accelerates the heart beat, the sound of an examiner's voice that reduces gastric tone, or the news of a bereavement that brings tears to the eyes, are all obvious examples. The conditioned responses that Pavlov studied were of the same nature, and shown to be mediated by the cortex. Experimental evidence of cortical autonomic function has not been lacking, for from 1870, when the discovery that excitation of the cortex would produce movements of the limbs was made, a host of investigators has recorded a great variety of effects on blood-pressure, heart-rate, sweating, pupillary size, and so on from cortical stimulation. Further-

more, there have been many clinical observations leading to the same conclusions; for example, that hemiplegia is often associated with vasomotor disturbances of the affected limbs. But, until comparatively recently, critical workers have tended to ignore this body of work, for it was unsystematic and rather crudely performed.

However, in consequence of the long series of investigations by J. F. Fulton and his collaborators into the functions of the frontal lobes (1930 onwards), and the introduction of leucotomy by Moniz in 1935, the subject has been investigated again much more intensively. As I had the privilege of working in Zurich last summer* with Professor Hess and Dr. R. B. Livingston, a distinguished worker from Prof. Fulton's laboratory, I take this opportunity of presenting a short review of past and present work, which apart from its own interest, has a wide bearing on clinical problems in the field of psychosomatic medicine.

Recent Experimental Work

The first cortical regions to be studied were the pre-central areas. In the course of ablation experiments at Yale, Margaret Kennard noted that the corresponding crossed limbs showed vaso-constriction, so that the temperature of those extremities always tended to be below that of the unaffected side. Conversely, Green and Hoff showed that stimulation of the same areas caused an increase of blood-flow to the muscles of the limbs while the vessels of the splanchnic region constricted. Further important work by Axel Lund in Copenhagen makes it clear that this is a means of adapting the circulation to the demands of muscular activity resulting from excitation of the same pre-central motor cortex. Respiratory changes arising from the same areas (Smith 1938) clearly serve a similar function. From the precincts of the face area salivation may be caused by stimulation, and from the eye-fields lachrymation and pupillary changes result. Darrow has shown a close correspondence of the "psycho-galvanic" reflex and sweat-gland activity, and in cats this has been found to depend on the integrity of the

* This was only made possible by a generous grant from the Leverhulme Foundation, for which I am very grateful.

premotor region and the temporal pole. Gastro-intestinal activity is apparently subdued by the cortex. An observation which led to early interest in this was that of Watts and Fulton (1934) who found that some monkeys with the frontal lobes removed died of intussusception — fortunately a rare occurrence in human beings after frontal leucotomy—while Sheehan caused inhibition of peristalsis by stimulation of the premotor cortex. In general, with regard to these results we can say that there is a considerable overlapping of the autonomic foci with the corresponding areas serving somatic functions.

The Orbital Surface of the Frontal Lobes

Since 1938, however, interest has turned away from the easily accessible lateral surface of the hemisphere to the orbital surface and the cingular gyrus on the medial surface. Attention was drawn to the relations of the orbital surface to autonomic functions by the observation of Bailey and Bremer (1938) that stimulation of the vagus caused electrical activity in the lateral orbital gyris and nowhere else in the cerebral cortex. Two years later Bailey and Sweet demonstrated that stimulation would cause arrest of the respiration—this was originally described by W. G. Spencer, one of Sir Victor Horsley's colleagues, in 1894—together with changes in blood-pressure and in gastro-intestinal activity. These responses have been fully investigated by Delgado and Livingston (1948) who describe the pressure effect as being either a slow rise with relatively long latency, or a short, sharp fall. Associated vasomotor responses are marked, and may be set off by thermal stimulation, such as the application of cold pledgets of cotton wool, as well as by electrical stimulation. This hints at a possible rôle in temperature regulation if the cortex is sensitive to changes in the temperature of the blood, as certain regions of the hypothalamus are known to be. Stimulation of the corresponding regions in patients about to undergo leucotomy have also shown similar effects. (Livingston and others, 1948.) Ablation of the lateral orbital gyrus causes a rise in temperature in the opposite limbs due to vasodilatation, and so presumably has a vasomotor influence antagonistic to the premotor zone. This has led to the suggestion that section of the radiations from this area might be beneficial in hypertension patients, and it is interesting

to note that, in view of the possible relation of the renal "Oxford shunt" to the cause of essential hypertension, prolonged stimulation of the orbital surface seems to produce the diversion of blood from the kidney cortex. (Cort, cited by Fulton, 1949a.) It is also said that orbital ablation will make schizophrenic patients more extroverted and sociable. However, in monkeys, bilateral ablation of the orbital gyri has been followed by five-fold, apparently purposeless increase in activity (Ruch and Shenkin, 1943), and in cats it causes "sham rage" reactions, neither of which would be a very desirable alternative to the disease for which it was proposed as a cure.

The Cingular Gyrus

Another region that has attracted considerable attention in the past few years is the anterior cingular gyrus on the medial surface of the hemisphere, next the corpus callosum. This is of interest, because it is the area of the cortex which has the most well-defined anatomical connection with the hypothalamus (through the mammillo-thalamic tract to the anterior nucleus of the thalamus, and thence to the cingular gyrus). Stimulation of various points in this region (Smith 1945) produces cardiovascular effects, either a fall in blood-pressure with slowing of the heart, or a rise with cardio-acceleration; it causes respiratory arrest, and pilo-erection and dilatation of the pupils. This gyrus has also been shown to be a "suppressor" zone by McCulloch, and activation of it by strychnine or electrical stimulation will depress cortical activity in other regions and inhibit the tone of the skeletal musculature, although it has recently been denied that this occurs in the unanaesthetized animal. Ablation experiments have been done by Smith, who found that it produced monkeys that were tame and especially easy to handle, and Ward has given a detailed description of this behaviour. He says that they lose their normal fear of man, and are more forward and inquisitive. At the same time they tend to treat other animals as inanimate objects, walking over them and taking food from them, but apparently being surprised at the hostility it evokes. Ward summed it up by saying that the operated animals had lost their "social conscience." But, because this was interpreted as a loss of fears and anxiety, localized excision of this gyrus has been performed on psychotic patients in preference to the more severe operation of lobectomy.

However, no impressive results have yet been reported.

Artefacts to Beware Of

A feature that has become apparent in all these investigations is that the response of the cerebral cortex to electrical stimulation varies very greatly with the anaesthesia employed, and with the character of the stimulus, especially as regards frequency and duration of the pulses. Changes in frequency may not only reverse an effect completely, but may produce something quite different. For instance, Livingston has shown that different rates used in stimulating a single point in the cortical eye-fields may elicit deviations of the eye to either side, or pupil changes, or lachrymation. The effects of anaesthesia, although they would seem so obvious, have not, in fact, been at all fully investigated.

The technique evolved by Prof. Hess in which fine electrodes are implanted in the brain under nitrous-oxide anaesthesia, and stimulation is carried out when the animal (cat) has recovered consciousness, is, therefore, of great interest. Hess was also one of the first neurophysiologists to appreciate the careful control of stimulation frequency. The results of the work done last year are not yet published, but some of the findings are as follows. Stimulation of the orbital and cingular gyri in cats, under barbiturate anaesthesia, with kymographic recording of blood-pressure and respiration, showed arrest or slowing of breathing on stimulation of any effective point in these two zones. Blood-pressure was also altered, a rise or fall being obtained on stimulating discreetly separate points in these two regions. Orbital gyrus stimulation in places caused profuse salivation, while from the cingular gyrus pupillary dilatation was common. In the unanaesthetized cat, the blood pressure could not be recorded, but respiration was never seen to be arrested as it was in the narcotized animal; indeed, it frequently became both faster and deeper. The pupil reaction from the cingular gyrus depended on frequency; 4 stimuli per second produced constriction, whereas 8 per second caused dilatation. This was accompanied by deviation of the eyes, and there is evidence that the cortical representation of eye movements in the cat is on the medial surface of the hemisphere.

The Anatomist's Contribution

The anatomical basis of these effects

mediated by the cortex is not at all certain. Classical histological methods only revealed such tracts as the fornix, from the hippocampus to the mammillary bodies of the hypothalamus, and the mamillo-thalamic tract of Vicq d'Azyr. In 1933 Le Gros Clark and Boggon demonstrated fine fibres running in the wall of the third ventricle from the hypothalamus to the dorso-medial nucleus of the thalamus, which has widespread connections with the frontal cortex. Finally, extensive studies with strychninization ("physiological neuronography") indicate that the frontal and orbital areas directly activate the nuclei of the hypothalamus. No one can say whether corticofugal pathways not involving the hypothalamus play any part in mediating autonomic effects.

Architecturally, with the exception of the premotor area, all the cortical areas from which autonomic effects have been obtained are similar in that they are simpler in structure than the six-layered cortex of the most highly developed regions. Together they have been styled the mesopallium, or mesocortex. This surrounds the upper end of the brain-stem and includes all the areas that until recently were called the smell-brain (rhinencephalon) such as the hippocampus, uncus and the cingular gyrus. The projection pathways are probably short with frequent relay-stations (Yakovlev). Thus an anatomical unity is beginning to appear in what were thought to be completely diverse cortical areas. A recent report describes autonomic responses from the temporal lobe near the uncus and the island of Reil while the more inaccessible hippocampus can be predicted to be similar in function.

What Does it all Mean?

The interpretation of the experimental findings in terms of normal function is not easy. Eliciting a response by electrical stimulation merely shows that a physiological connection is a possibility, but does not prove that it is the normal mechanism. The hypothalamus is the lowest (most caudal) level in the brain where all autonomic effects can be produced by stimulation, though some, notably respiratory, vasomotor and cardiac activities are integrated to a considerable extent in the medulla oblongata. About the part played by the cortex in relation to the hypothalamus one cannot dogmatize. One view is that the hypothalamus organizes the day-to-day running of the visceral activity,

and that the cortex intervenes only insofar as adaptations are needed in response to sensory stimuli from the external environment, for it is the cortex that receives all sensory messages from outside. In Sherringtonian language we may say that "the hypothalamus is the head ganglion of the autonomic system," but that it is influenced by the cerebral hemispheres which are "the head ganglia of the distance receptors." This is close to Hess's views. Other workers, however, notably Fulton, consider that the cerebral cortex represents the highest level of integration of nervous activity, and so the representation of the autonomic nervous system in the cortex must be the dominant factor in its control. The two views are not, in fact, mutually exclusive, for reciprocal influence between higher and lower centres, between cortex and hypothalamus, undoubtedly exists. Destruction of hypothalamic nuclei reduces activity over the whole of the cortex very greatly, and conversely, epileptic fits of a quite typical "grand mal" type can be set off by stimulation of the diencephalon—Penfield, for example, now thinks that generalized epilepsy arises from this part of the brain. Thus a constant mutual activation probably occurs, the hypothalamus being in an especially important position at the upper end of the brain-stem, through which all radiations must pass.

All this would be merely dry academic controversy, if it had not been shown that operations, on just these parts of the brain that we have been discussing, do have a profound influence on patients with

psychoses, neuroses or intractable emotional disorders. The special importance of operating on the foci of autonomic activity is not altogether surprising, for the subjective sensation of an emotion is inseparable from the visceral changes accompanying it. It pervades our ideas of emotion; remember the cold sweat and sinking feeling of fear—the stomach and bowels are traditionally and metaphorically always linked with it. We cannot conceive of excitement without a rapid, bounding pulse and dilated, shining pupils; or of anxious anticipation without cold feet, or of pleasant culinary anticipation without salivation. May it not be that the quality of our feeling *depends* on the visceral changes that accompany it? If that is so, we can say that we have been discussing the physiology of human happiness.

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NEUROMANIA

OR

THE PHYSIOLOGICAL BASIS OF PSYCHIATRIC PRACTICE

By M. HOLLIDAY EVANS

I STRODE swiftly from the lift, marched boldly up to the door, and without a moment's hesitation . . . I hesitated. The lettering on the frosted glass panel said "Dr. Anatole Gurk, Psychiatrist."

"Be a man, Stainton," I said. "After all, it is him whom you have come to consult. Him it is with whom you have to consult with," I said, for I like to experiment with my grammar. I was talking to myself: there was no one else in the vicinity. Frequently I talk to myself these days. And nights, too. The reason for this is that I am the most brilliant conversationalist I know. More brilliant than Oscar Wilde, Alexander Woolcott, or the gentlemen who gaze into the cosmic crystal before the one o'clock news. And I do so love good conversation.

For a moment I stood there, wrapt, like Macbeth when he heard about his promotion. Then the door opened, and with a sudden quickening of the senses I realised that I was definitely, irrevocably, on the threshold. A man stood before me. I knew it was a man: he had all the earmarks. Imagine my unastonishment when he said, "Come in." I sidled past him, hurled myself upon the couch, and tried not to look at the "Men Only" calendar on the wall.

"The dream, Doctor," I cried, "it's the dream!" I hazarded a guess as to his identity. He came over to the couch wearing an enigmatic expression, pince-nez, and a liberal dressing of Vaseline hair tonic. Plus, of course, the usual gent.'s double-breasted. "Where were you born?" he asked. "In a maelstrom," I replied. "Or it may have been a femaelstrom, I'm not quite sure. I was too young to appreciate fine distinctions, at the time." The doctor nodded. "That accounts for it," he remarked, "or part of it, at least. But go on."

"I shall try to present the events of my dream in logical sequence," I began.

"Chronological or biological?" he asked.

"Yes," I replied, "it starts with a girl."

"Does it, though!" exclaimed the doctor, slapping his thigh. I made haste to continue, before he should get completely out of hand.

"In my dream," I explained, "the girl is seated in a chair facing the foot of my bed. It is winter, and there are icicles hanging down on either side."

"Of the end?"

"Of my moustache."

"But you are clean-shaven!" cried the doctor, tugging at my upper lip to make sure.

"Not when I dream," I told him. "Once in the arms of Morpheus I become the acme of masculine maleness. I even have hairs on my chest. Four," I added, in the interests of scientific accuracy. "And then it happens!" I continued climactically. "Suddenly I notice the big toe on my right foot. It is sticking out from beneath the blanket. I try to draw it under again, but do you think I am able?"

"I don't know," said the doctor, "you've been raising Cain ever since you've been here."

"No!" I cried, answering my own question. "Up it stands. Or, rather, out it sticks. So quiescent! So vulnerable! So . . . !"

"Toe-like?" suggested the doctor.

"Precisely so," I agreed. "And then . . ." Beads of sweat rolled off my brow as the memory came flooding back. "And then she begins moving towards it. Effortlessly, relentlessly . . ."

"The girl?"

"The girl. With a quick flick of her torso she stoops and sinks her teeth into it."

"The toe?"

"The toe," I muttered feebly. The effort of recital had exhausted me, and I fell back in a state of semi-colon.

The doctor made an effort to restore me to consciousness. "And then?" he asked, rapping me on the Adam's apple, with a well-thumbed copy of Freud.

"And then I wake up," I whispered.

"Any marks on the toe?" asked the doctor, rubbing his hands together in a brisk, professional manner. "Any abrasions or conclusions?"

"Yes!" I exclaimed, roused by his uncanny insight. "There are marks on the toe. Distinct traces of nocturnal maltreatment."

"Uh—huh!" commented the doctor, with a significant pause between the "uh" and the "huh." He rose and began pacing the floor, lines of concentration or indigestion furrowing his otherwise ascetic countenance. At last! I thought, the un-subbing of my

conscious. The subtle, seemingly irrelevant question . . .

"Tell me," he rapped.

"Yes, doctor?" I said, breathless with anticipation as he paused before me.

"Has your landlady a cat?"

I was in a state of bemusement. What line of thought was this? However, I answered his question: it was the polite thing to do.

"Yes," I said, "she has a cat."

A look of relief crossed the doctor's face. "Well, that's it," he said. "Shut your door at night and you'll be O.K."

"But doctor," I interposed, "she has no teeth."

"Who, the landlady?" asked the doctor, loth to abandon his lightning diagnosis without a struggle.

"No," I said, "the cat. I knocked them out with a boot one day when I found her polishing off the plate of salmon which I had put out for my supper."

"What about claws?" snarled the doctor, biting his finger nails down to the metacarpals.

"She ripped them out trying to get at me after I knocked her teeth out with a boot one day when I found . . ."

"I heard you the first time," said the doctor, brusquely. "Well, I'm afraid we'll have to do the chores, after all. Any unfortunate experiences in early life?" There must be a woodshed somewhere behind that misshapen ego.

"Any old woodshed?" he added cajolingly.

"No doctor," I replied. "Our third floor flat didn't run to woodsheds. Why, we even had to share the bathroom."

"BATHROOM!!!!"

As I spake that simple word a bolt shot back in my brain, sweeping away with its illumining beams the encrusted sediment of Time.

"That's it!" I cried, "not a woodshed, doctor, a bathroom!"

"Well!" said the man of science. "Well, well!! It's not every day we run across a good clean complex like that. Tell me more."

"It was Auntie Rosie's fault," I began, "she wasn't as deaf as I thought. She wasn't really my aunt," I explained. "She lived along the passage from us, and used to give me pennies for running errands, so I called her auntie out of respect. One day she gave me sixpence and my respect increased so much that I wanted to give her a boost up the family tree. I offered to call her grannie."

"I'm positive she didn't take you up on that," said the doctor. I was amazed at his omnivorous knowledge of the human heart.

"How do you know so much about women?" I asked.

He lowered his eyes. "I've done some research," he replied modestly. "But go on."

"Well," I said, "one day my father called me into his study. He was bending a young sapling over his knee, testing it for pliability. Some sixth sense warned me of an approaching ripple on the domestic millpond."

"Stainton," said my father, rolling up his shirt-sleeves, "what's this about you looking through the bathroom keyhole?"

"How old were you at the time?" asked the doctor.

"Nine," I replied. The doctor looked at me with a new-found respect.

"The spirit of scientific enquiry," he said, "we have much in common." I was gratified by his approval.

"I looked my father straight in the face," I continued, "without one flinch, blinch, or bat of an eyelid. 'Father,' I said 'who is responsible for this malicious report?'"

"'You are,' he replied. 'Rosie says she heard you scuffling about outside the door while she was taking a bath last night. Did you or didn't you?'"

"'What?' I asked wildly. My young sensitive soul was not yet proof against the world's calumny. Also I was playing for time."

"'Look through the keyhole!' repeated my father."

"'Alas,' I cried, 'I am but a simple lad. I know nothing of accusation, and refutation, of circumstantial evidence, or habeas corpus, save what few gleanings I have glone from the legal section of the British Museum. Yet, if answer I must, I base my defence on three points."

"'First, I never went near the bathroom on the night in question. Second, I was only bending down to tie my shoe-lace. And third, she always blocks the keyhole with paper anyway. Would you believe this woman, this stranger,' I cried, 'rather than your own flesh and blood?'"

"'Of course not,' replied my father, standing up and flexing the short head of biceps, 'but just in case . . . ' I apologise for breaking off at this point, doctor," I told him, "but over what followed I prefer to draw a veil."

The doctor let out a gasp of indignation.

"Monstrous!" he exclaimed, "perfectly monstrous! To accuse an innocent boy, nay, scarce more than a child of such crudeness, such insensitivity, such lack of perception!"

"Yes," I broke in, "that . . . that was what really hurt. As if I didn't KNOW she blocked the keyhole!" A look of shy pride lit my features. "That's why I bored a hole through the door."

The doctor's face turned ashen. He looked quite burned up. "What?" he muttered hollowly.



"Through the bottom left hand panel," I explained, "right in the corner, where it wouldn't show. With my father's hand-drill," I added, giggling brazenly.

The doctor passed a damp hand over his brow. "Tell me," he said, "are you normally at your ease with women?"

I tried to answer, but my mouth went dry, and my tongue felt as big as a marrow. There was a copy of *La Vie Parisienne* on the doctor's desk. I had been trying not to notice it for the past ten minutes, and the strain was telling.

"The opposite sex!" exclaimed the doctor, relapsing into technical jargon, "Are you comfortable in the presence of the opposite sex?"

My reply was not entirely convincing. "Phmm . . ." I said. "Ngaaa . . ."

The doctor put his fingertips together and closed his eyes. "At a guess," he said, "at a guess I should say that you are allergic to women who take baths. Or even showers," he added.

As if by magic, a weight suddenly lifted from my cerebral hemispheres. "Well, in hell's name!" I shouted. No wonder my girl friends have never been socially acceptable! My feelings were so indescribable as to be beyond description. I shot a bold glance at the doctor's desk. A strange sense of power flowed through me. Well, why not? I asked myself. I rose from the couch, sauntered over to the desk, and picked up *La Vie Parisienne*.

"Hmm . . . not bad!" I remarked. "Trifle on the skinny side. I like a woman to BE a woman, myself."

The doctor regarded me with unqualified admiration.

"Now we've brushed away that little cobweb we shouldn't have any more trouble," he said.

He walked round the desk, and stood in front of me. His hands were going through a quaint little pantomime, as though they were folding a succession of crisp pound notes and then transferring them to his breast pocket. I wondered if I dared mention the sordid subject . . .

"By the way, what is your fee, doctor?" I asked, risking it.

"WELL!" he replied, booming out his words, except for one or two which slipped in as if by accident, "WELL! IN VIEW OF THE LONG AND EXPENSIVE COURSE OF STUDY WHICH WE MEDICINE MEN, THAT IS TO SAY, WHICH WE MEN OF MEDICINE MUST UNDERGO, AND NOT FORGETTING THE INVALUABLE SERVICE I HAVE JUST RENDERED YOU, I DON'T THINK, ON MATURE CONSIDERATION, THAT twenty guineas IS ASKING TOO MUCH."

There was a pause, hushed and expectant.

"Doctor," I said, "did you ever have any unfortunate experiences in your youth?" He favoured me with the tolerant smile of one who is not averse to a little light badinage before collecting twenty-one quid.

"Of course," he replied. "We of the profession are no more immune, no more insulated from external stimuli, than, shall I say, hoi polloi? We just build up more resistance that's all."

"And how is your resistance now?" I pressed him.

"Oh, grand," he assured me, "simply grand. Nothing can shake my composure now."

"Would you like to make a small wager on that?" I asked. Before he could reply, I picked up a priceless old Sèvres warming-pan and stunned him with one God-Almighty blow.

And then, dancing lightly out of the office I bumped into positively the most gorgeous redhead that ever poured herself into a black strapless evening gown.

"Bay-bee!" I said, in a deep husky baritone tone that I didn't know I had in me. I held her gently but firmly by the elbows, and as I looked deep into her long-lashed green

eyes I felt that at last I had found the Real Thing. In less time than it takes to tell, her satiny arms were round my neck and her cherry lips were glued to mine. Suddenly I held her roughly at arms length. Or, rather, roughly I held her at arms length. That is to say, I held her at arms length, roughly. Hell! she wasn't worrying about the position of the adverb.

"Honey child, honey pie, honey bee," I said (for I was sweet on her by this time), "enough of this love-making! Come!"

She paused only long enough to repair her make-up, change her nylons, and give herself a Toni, and then, hand in hand, like two zephyrs caressing the brow of yon distant hill, we faded into the night.

CHANGE OF EDITORS

We announce the resignation of the Editor, M. Braimbridge. He will be succeeded by J. A. Williams. M. B. McKerrow is Assistant Editor.

SPORTS EDITOR

The Sports Editor, P. D. Moyes, has resigned. He will be succeeded by M. Braimbridge.

NOTICES.

There was recently a Sister at Bart's who plastered the walls of her kitchen and Path. Room with small notices, of which the following are genuine examples:—

"Housemen must not fiddle in Sister's drawers."

"Samples of urine must not be thrown away unless passed by Sister."



Just another test, Mr. Biggs.

By G. C. R. MORRIS

BENIGN neoplasms of the gastro-intestinal tract are not uncommon, but few of them cause symptoms. The large intestine is the commonest site, and adenoma the commonest histological type. The tumour is usually polypoid, projecting into the lumen of the bowel; intramural and subserous tumours are rare. The following clinical history illustrates the course of a polyp high in the pelvic colon.

Case History

The patient was a woman of 38 who had suffered with diarrhoea for five years. It started early in 1945, when she and her year-old daughter were caught by the blast of a "V2" rocket explosion. Neither was injured, but the mother began to pass frequent loose motions, of small quantity and normal composition, without mucus or blood; she also experienced a periodic gripping pain in the left iliac fossa. Her condition was treated first as a "nervous diarrhoea," then as an "infective enteritis," and finally as a "colitis": a barium enema revealed no abnormality. After a few months she improved considerably, and a remission broken only by occasional brief attacks of watery diarrhoea lasted until the end of 1949. Then the attacks became worse and more frequent, and the pain returned with greater force. On a few occasions the stools were pale and streaked with blood, and in the middle of February she passed a small amount of bright

blood. When she was seen in the out-patient department of this hospital on February 21 her sigmoid colon was palpable, but no other abnormality was detected.

Sigmoidoscopy a fortnight later was negative, but a barium enema examination, at which the sigmoid colon was both palpable and tender, "revealed the presence of a large polyp in the descending colon which after evacuation was seen to have produced some degree of intussusception. This measured approximately 10 cm. in length" (Fig. 1, 2.)

She was admitted under the care of the Surgical Unit at the end of March. She had lost a little weight in the previous months. There was no family history of neoplasm, either benign or malignant. She had had a lump removed from her right breast at the age of 22, and had otherwise always been well.

Examination showed a slender woman of pale complexion with no abnormal physical signs. A course of sulphathalidine (G 2 six-hourly) was begun. Sigmoidoscopy (4.4.1950) did not reveal any abnormality.

At operation two days later the abdomen was opened through a left muscle-splitting incision under thiopentone, gas, oxygen and ether. The colon was examined, and a soft round mass without a pedicle was felt at the junction of the descending and pelvic parts of the colon, attached to the mesenteric border and filling the lumen. Faecal masses

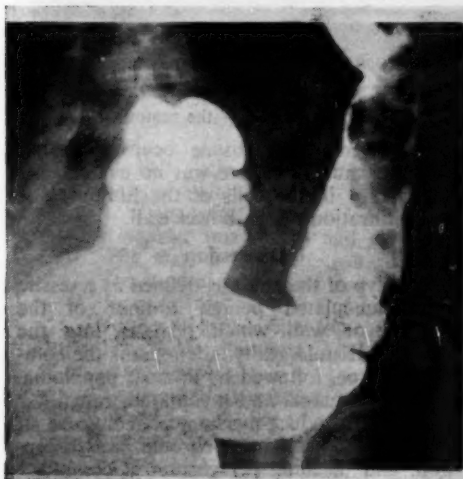


Fig. 1. Barium enema; filling defect.



Fig. 2. Polyp and intussusception.

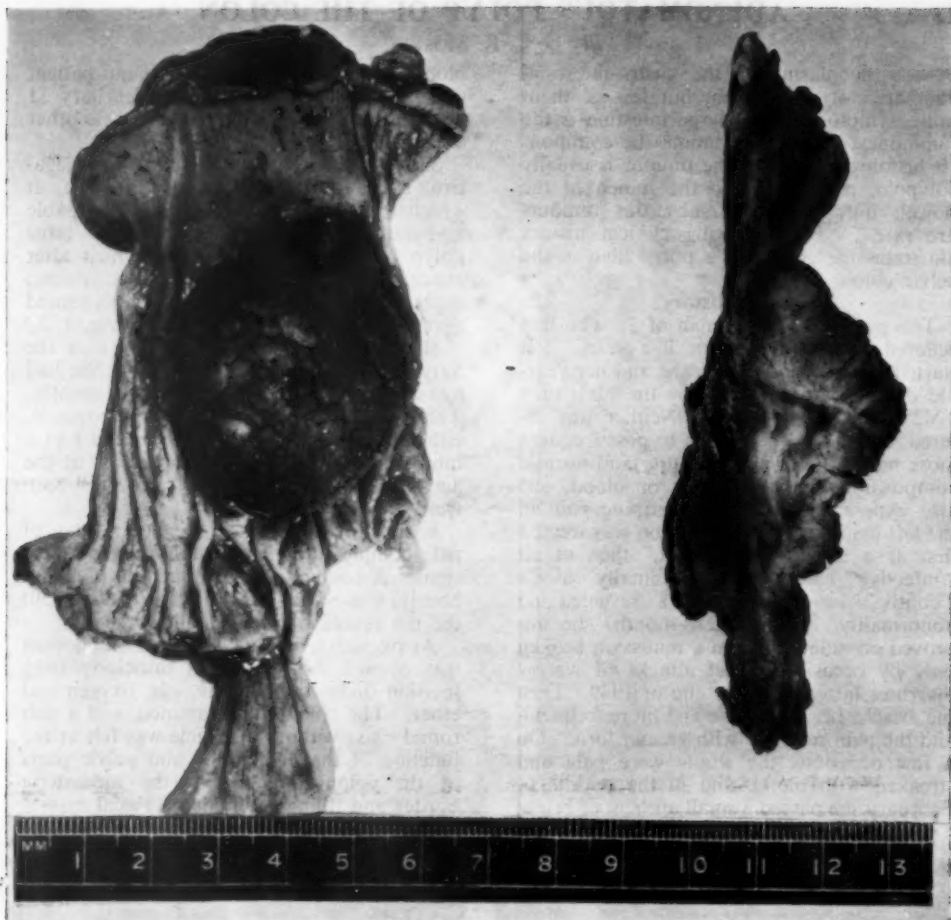


Fig. 3. The specimen excised.

proximal to the polyp were pushed past it, and manipulation demonstrated that the polyp could easily lead an intussusception into the thin and distended part of the bowel. The segment of colon bearing the polyp was excised, and an end-to-end anastomosis performed. The abdomen was closed in layers with peritoneal and subcutaneous drainage.

Recovery was satisfactory, and the patient was discharged after two weeks with normal bowel action.

Examination of the specimen excised showed a hemispherical tumour 5 cm. in diameter with a finely lobulated surface (Fig. 3, 4). The microscopic structure was that of an adenoma, the central branching stalk of



Fig. 4. Section of the tumour.

vascular connective tissue bearing normal secreting mucosa: there was no evidence of malignancy in the cells of the tumour, nor any infiltration of the bowel wall.

Discussion

A polyp of the colon is defined as a sessile or pedunculated benign tumour of the mucosa or wall which projects into the lumen.¹⁰ Histologically, adenoma is the commonest type, followed by lipoma; papilloma, fibroma, angioma and myoma are rare.^{7, 8}

All may produce mechanical symptoms, of subacute obstruction or chronic intussusception, and bleeding per rectum is common.¹ Constipation occurs particularly with polyps

in the region of the rectosigmoid junction; other possible symptoms are tenesmus, protrusion of a mass per anum, and pruritus. Diarrhoea is unusual, and the exact significance of it in this patient is open to question; but the colic and the bleeding suggest the correct diagnosis.

Diagnosis depends on careful investigation. The tumour or the intussusception may rarely be felt per abdomen, and more often per rectum. About half of the polyps occur in the rectum and sigmoid, within reach of the sigmoidoscope;³ the remainder must be sought by the radiologist. The larger ones will show as filling defects in a barium enema, but evacuation and air replacement is advisable, and repeated examination useful.⁵ In this patient both the polyp and the intussusception were clearly seen: the negative report in 1945 is not evidence that no polyp was present at that time, although the sudden onset of symptoms implies something other than a purely mechanical origin.

The natural history of such a condition is not yet defined, but there is strong evidence that all polyps of the colon and rectum should be regarded as pre-malignant.² Ulceration of the surface or induration of the base is diagnostic of malignancy, and the histological change may occur in any part of an adenoma of any size at any age.⁴

Inspection and palpation are insufficient to determine innocence, and biopsy is often inadequate. Excision, whether by colotomy

or by diathermy snare through a sigmoidoscope, should be followed by serial section to decide the advisability of a more radical procedure: fulguration of rectal polyps demands careful follow-up.⁹

The incidence of polyps of the large bowel has varied from two to ten per cent. in long post-mortem series,^{3, 4, 6} and more than one polyp is found in half the cases. The proportion of these polyps which cause symptoms is small, as is probably the proportion which exist long enough to become malignant; but it is clear that they should be suspected, sought and treated.

My thanks are due to Professor Sir James Paterson Ross for his permission and encouragement to report this case; also to Dr. R. A. Kemp-Harper and Dr. G. D. Cunningham for their advice and the radiological and pathological reports.

The photographs were taken by the Department of Medical Photography.

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AN AUTHENTIC LETTER

From an African employee at the Groundnut Scheme in Tanganyika:—

Dear Sir,

Kindly allow me to have only a little opportunity to say what I have seen in my life this year.

Through bad luck my upper teeth got broken recently. That they got broken during 3.3.49. They were broken as follows:—

- (a) The four small teeth had gone.
- (b) The three big did the same to my left mouth.
- (c) I mean from the first small tooth to the third to the third big tooth left.
- (d) Six teeth remained to my right mouth.
- (e) Three teeth remained to my left mouth.

There are only nine teeth remained to my mouth. I wonder:

Sir, the seven teeth of mine are wanted by

me the chance of getting any occurs in your Department.

The kinds I want are the first Class. The excellent, permanent teeth. The one which can not be pulled off during any meal please.

Be kind enough and tell me the price of the seven teeth; so I may be able to post money to you immediately I receive the reply. You too you many be able to post the seven teeth to me as soon as my money appears to you please.

Please make my fourth small tooth left yellow (gold!) in colour sir. See that I am ready waiting for the result only, even if the price is expensive I do not mind concerning that I get my seven teeth as past.

I am losing quite a lot of my appearance because of my absent teeth. Therefore may I know the result within this week please.

Yours sincerely servant,

XYZ.

PERSONALITIES AND PROGRESS IN THE STORY OF DIABETES MELLITUS

By S. F. MARWOOD

(Continued)

Before proceeding to an account of the more accurate pin-pointing of the morbid process, we may spare a thought for those who made the manifestations of ketosis and diabetic coma less mysterious. Names are many. Petter discovered acetone in the urine of diabetics in 1857. There were Adolf Kussmaul and his great successor, Bernard Naunyn, and Naunyn's pupil, Magnus Levy who wrote on diabetic coma and its treatment, and postulated that acetone bodies are found when carbohydrate is lacking or not being utilised in a normal way. There was Rosenfeld who said "fats burn in the flame of carbohydrates," and there were many others such as Ebstein, Kaufman, van Noorden, and Hirshfield, but the names of Kussmaul and Naunyn particularly demand recognition.

Adolf Kussmaul was born in 1822 and died in 1902. An army surgeon for some years after qualification, he successively became professor at Heidelberg, Freiburg, and Strasburg. One of medicine's great

pioneers, he was the first to describe periarthritis nodosa and progressive muscular paralysis, to diagnose mesenteric embolism, to attempt oesophagoscopy and gastroscopy, and to do gastric lavage. Fifteen years after Petter's discovery of acetonuria, Kussmaul demonstrated acetone in the blood, and it is in connection with diabetic coma and the chain of events leading thereto that he is best known to us. The characteristic dyspnoea of the comatose diabetic bears and perpetuates his name, and extracts from his own writings on the subject make interesting reading. Thus he says:—

"Since I have seen three diabetics in the course of a year die with remarkably similar symptoms in which there was a peculiar comatose condition preceded and accompanied by dyspnoea, I believe that it is not merely a play of chance, but has to do with a form of death in diabetics which bears the closest relationship to the disturbances in the metabolism."

He then carefully describes the three cases, and notes "the great loud breathing preceding death." He stresses the absence of any suggestion of obstruction to breathing, and particularly notes the contrast between the marked general weakness of the patient and the strength of the respiratory movements. He draws these conclusions:—

- (1) The dyspnoea is not the product of reflex excitation of the respiratory centre from vagus or laryngeal nerve, but is due to direct central stimulation.
- (2) It is not due to lack of oxygen in the respiratory centre.
- (3) It is not the result of an inordinate increase of carbon dioxide in the blood.
- (4) It can only have its cause in an intoxication of another sort which stands in close relationship to the chemical disturbances of the body in diabetes. Concerning the nature of this toxic agent, nothing can be said for a certainty at present.

Even at that relatively distant period, Kussmaul knew that the intoxication was the expression of a profound metabolic disturbance. Knowledge of the disordered metabolism of fats was yet to come, but he



Ebers Papyrus.

was nearing the truth, and his observations entitle him to a place among the elite.

Bernard Naunyn succeeded Kussmaul at Strasburg. Well known for his work on gallstones and diseases of the liver and gall-bladder, he is even better known for his metabolic and other researches in diabetes. In 1892 he wrote his famous monograph and, in 1906 introduced the term acidosis. Enunciating principles of diet which are mostly applicable today, he advocated reduction of total calories as well as carbohydrates. His aim was to make and keep patients sugar-free, for he had noted the rise in sugar tolerance when the urine was kept free of sugar for long periods. Naunyn established the principle that the treatment of diabetic coma, actual or threatened, is the basic treatment of diabetes and not merely that of acidosis, and thereby discredited the alkali treatment which was fashionable. He recognised the innocent occurrence of glycosuria in individuals whose renal leak-point was subnormal, and he stressed the unity of the disease, insisting that all diabetics were united by the common bond of diabetic heritage. Naunyn's influence on the development of a rational outlook in the treatment of diabetes mellitus was immense, and his place in medical history is assured.

In the meantime, equally important

researches were resulting in the incrimination of the islet cells as a principal seat of the morbid process. In 1873, Eugene Lindsay Opie who was later to become Professor of Pathology successively at Washington, Pennsylvania, and Cornell, noted, whilst still a demonstrator at Johns Hopkins University, that the islet cells of a girl who had died of diabetes were in a state of hyaline degeneration. So pronounced was the change that, even in the tail of the pancreas, they were scarcely recognisable, whereas the acinar structure was little affected. The importance of this observation needs no emphasis.

In 1889, Vassale ligated the duct of Wirsung in a rabbit. The animal survived for 150 days, and at no time exhibited glycosuria. Post-mortem examination revealed healthy islets in a ruin of atrophied acini.

The evidence was accumulating and, during the next twenty years, numerous observers were to confirm these findings. The names of Diamara the Italian, and McCullum of America figure prominently, but it was another Italian, Massaglia, who finally removed the subject from the realms of hypothesis and inference, and demonstrated positively that a lesion of the islet cells in the presence of healthy acini would cause diabetes. This he did in 1912 by a most ingenious series of experiments on dogs and



Translator receiving an Arabic work of Rhazes.

rabbits. Time does not permit a description of his methods, and only his conclusions may be given. He states that the pancreas governs carbohydrate metabolism by virtue of an internal secretion from the pancreatic islets, a view only tentatively advanced a short time previously by Opie and Schäfer. He further asserts that a certain proportion of the islets have to be eliminated before diabetes ensues, and that alimentary glycosuria is the result of hypofunction of the islets. Here is the full flowering of experimental medicine, and its successful application to a problem which had long baffled us. All too little credit has been given to Massaglia, and it is a pleasure to pay tribute, in this brief and modest review, to one who occupies an essential place in diabetic history.

The next major and almost inevitable advance was the preparation of an extract of the islets which would replace the missing secretion, and restore the metabolic balance. Meanwhile, however, considerable strides had been made in the dietetic treatment of the disease. In America, F. M. Allen had been greatly impressed by his observations that diabetes regressed or even disappeared in cachectic states, and that fasting relieved the symptoms and increased the carbohydrate tolerance of depancreatized dogs, and he had become a great advocate of under-nutrition diets. His emphasis was on total metabolism, and reduction had to be general and not limited merely to carbohydrates. Allen's findings were supported by Joslin who had noted the diminution of glycosuria and ketosis in a patient suffering from acute pulmonary tuberculosis.

In England, Graham had arrived independently at conclusions differing only in detail from those of Allen. It was he who explained the apparently contradictory observations that fasting tended to produce ketosis in healthy subjects, yet lessened that of diabetics. He pointed out that, before treatment, the metabolism in diabetics is high—Benedict and Joslin had shown it to be 20 per cent. above normal—largely as a result of the abnormal fat metabolism and production of aceto-acetic acid, and it is this deranged metabolism of fats which is favourably affected by fasting.

Allen's system and Graham's well-known ladder diet consolidated a regime of treatment which was remarkably successful in mild cases, particularly in the older obese type, and reasonably so in moderately severe

cases. In acute cases, however, and especially in the young, it was impossible to maintain body weight on the very restricted diets necessary to keep the urine sugar-free, and the patients either died of intercurrent disease consequent on starvation, or, more commonly, failed to continue treatment, and, imposing more and more strain on the already depleted islet cells, went rapidly downhill, dying either in coma or as a result of pulmonary tuberculosis. Nevertheless, the dietetic discipline imposed by Allen, Graham, Joslin, McClean and others, and elaborated from principles enunciated first by Naunyn, brought new life to diabetics, and enabled large numbers to survive into the relative security of the new era which was so near at hand.

The scene now shifts to Professor Macleod's laboratory at Toronto in 1921, where Frederick Grant Banting had started work with the help and encouragement of Macleod, and with the assistance of C. H. Best, a second year medical student, and Collip, the bio-chemist. All four were to play a prominent part in the work of research that followed, but it is well to remember that it was Banting's inspiration in the first place which gave to humanity a treatment as dramatic as any in the history of medicine.

Banting was born in November 1891 on a farm outside Alliston, Ontario, and he qualified with the M.D. of Toronto university in 1916. Contemporaries say that he was not exceptionally clever, but was possessed of a very enquiring mind and a quiet determination always to see things through. In other words, he was a good sound man. He served overseas in the first world war, won the M.C., and was severely wounded. Returning to Canada in 1920, he first practised as an orthopaedic surgeon in London, Ontario, and at the same time, acted as a demonstrator of physiology at the university of Western Ontario. Becoming interested in the problems of diabetes mellitus, and particularly in isletin, as Scharpey-Schäfer had named the hypothetical secretion of the pancreatic islets, he gave up his unsuccessful practice and started work in Macleod's laboratory. Had he by any chance heard of Zuelzer who, inspired by the far-reaching experiments of Massaglia, had, ten years earlier, come very near to the discovery of a method for preparing an islet extract? After various chemical treatments, Zuelzer obtained an extract which reduced the hyperglycaemia on

injection into depancreatized dogs. Thus encouraged, he tried the treatment on human diabetics and successfully reduced glycosuria and ketonuria. Unfortunately it was attended by unpleasant and dangerous side-effects such as rigors and pyrexia which were believed to be due to impurities but some of which were doubtlessly the result of hypoglycemia. The treatment was abandoned, and it is curious that in Banting's writings are to be found no reference to the experiments of either Massaglia or Zuelzer. Be that as it may, Banting and his co-workers commenced their experiments and, in a short time, were fortunate enough to meet with startling success. They published their first results in 1922.

Briefly summarised, these tell us that the pancreatic duct of a dog was ligated and the normal secretory tissue allowed to degenerate. The dog was then killed by chloroform, and the degenerated pancreas swiftly removed and sliced into a chilled mortar containing Ringer's solution. The half frozen gland was then thoroughly macerated and the mixture filtered through

paper. The extract, raised to body temperature, was then injected intravenously into recently depancreatized dogs, and a marked reduction of hyperglycemia and glycosuria noted. Banting enjoyed a well-deserved good fortune, for success came from his first experiment. In a number of subsequent experiments, it was found impossible to exhaust the pancreas sufficiently to obtain an extract free from considerable impurities with their dangerous side-effects. Had it not been for this lucky chance, who knows but that Banting's work might have suffered the same fate as Zuelzer's.

The clinical test had yet to come. A suitable patient was selected for the all-absorbing experiment, but at the last moment he declined to be a subject, and thereby missed his chance of immortality. Not so a doctor, seriously ill with diabetes. He gladly offered himself and, in a short time, was restored to almost full vigour. The year was 1922, and the beginning of a new epoch in the history of diabetes mellitus. Experiments were continued, and it was soon possible to prepare the newly named insulin from normal healthy pancreas. Before long it was being manufactured on a commercial scale. As was to be expected, and as so often happens with a new and revolutionary treatment, there were, in the early days, many accidents due to impurities and to hypoglycemia but, with the passing of time, they have largely been eliminated by improvements in the technique of manufacture, and by experience in the use of the extract.

Recognition came swiftly. In 1923, the Nobel prize was awarded jointly to Banting and Macleod. Banting, hurt by the apparent lack of recognition of the part played by Best, insisted on dividing his share equally with him as did Macleod with Collip. Numerous medals were awarded him, among them that of the Society of Apothecaries, and many honorary degrees conferred on him by universities on both sides of the Atlantic. He was made an honorary fellow of both the Royal College of Surgeons of England and the American College of Surgeons, and, in 1930, elected F.R.S. He was knighted four years later. In 1930, Toronto University established an institute for research which was named after him, and he was made permanent Director of the Department of Medical Research to which he gave his share of the Nobel prize to provide a scholarship for young scientists. Lord Moynihan opened



Anatomical Theatre at Padua

the Banting Institute and gave what those who have been privileged to hear him speak would know was a most eloquent address, and, in speaking of Banting, he quoted Arthur O'Shaughnessy's couplet, "One man with a dream, at pleasure shall go forth and conquer a crown."

His death in an aeroplane crash in the Newfoundland wastes caused comparatively little stir happening as it did in the midst of the tragedy of the recent world war. Banting was a simple man, and would have been the last to claim the attributes of genius. Greater scientists, more brilliant and versatile investigators there had been, but at least the faith, inspiration, and tenacity which led him to a great success were equal to theirs, and countless thousands had reason to mourn the passing of a man whose name will be honoured for all time.

Much work remained and still remains to be done. The original insulin, improved upon, is still with us and, thanks to the researches of Hagedorn in the first place, has been supplemented with more slowly acting insulins possessing delayed and prolonged actions. All of these we are learning to use, either singly or in various combinations, and it is the low blood sugar rather than the raised which more often provides moments of drama.

The doctor who permits complete freedom in diet is more culpable than the patient who welcomes it. Most of us realise that, although dietetic discipline need no longer be irksome except perhaps for grossly overweight patients, there is still a need for control. So also should patients who trouble to study the directions issued by clinics such as that at St. Bartholomew's Hospital, or books written for their benefit such as *The Diabetic Life* by R. D. Lawrence. Obesity is a well recognised danger not only in diabetics themselves but in those who come of diabetic stock, and to prevent is often easier than to cure.

The changing picture of diabetic death increasingly focusses the attention of physicians on the many problems of cardiovascular degeneration, a further acknowledgement of the part played by the new therapy in prolonging diabetic life.

The emphasis in research has tended to shift from the pancreas to the other endocrines, particularly the anterior pituitary, and the work of Houssay and Potick, Young, Lukins, and of Haist, Campbell, and Best on depancreatized, hypophysectomized, and



Portrait of Banting.

adrenalectomized dogs justifies the new conception of diabetes mellitus as a syndrome. As Himsworth reminded us in his Oliver-Scharpey lectures at the Royal College of Physicians, such a conception envisages an interruption of the chain of metabolic processes at any one of several points, and therefore permits of several causations rather than the specific cause and cure for which one searches in a disease entity.

Banting's discovery was epochal, for it signalled the end of an era and the beginning of a new, and, as it provides a natural climax to a story which covers a period of 2000 years, this account virtually closes with it. What follows is contemporary history and a task possibly for another day. In the second Banting memorial lecture at Toronto in 1943, Joslin quoted what he termed the Banting chapter of the Bible. This consists of the first ten verses of the thirty-seventh chapter of the book of the prophet, Ezekiel, and the last verse reads, "So I prophesied as he commanded me, and the breath came into them, and they lived, and stood upon their feet, an exceeding great army."

My grateful thanks are due to Dr. Kenneth Black, to Mr. John L. Thornton, Librarian at St. Bartholomew's Hospital, and Mr. W. J. Bishop, Librarian of the Wellcome Historical Medical Library, and to Dr. E. Ashworth Underwood.

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An Address to the Cossham Medical Society, Bristol, on October 16, 1949.



I don't think that was funny, Hosford.

SPORT

CRICKET CLUB

v. MIDDLESEX HOSPITAL

Played at home, on Saturday, May 20. RESULT: Drawn.

St. Bartholomew's Hospital 150—8 dec. (J. A. Clappen 34).

Middlesex Hospital 67—7 (B. K. Arthur 4—20).

v. ROMANY C.C.

Played at Chislehurst on Sunday, May 21. RESULT: Won by 61 runs.

Bart's batted first on a wicket that gave very little help to the bowlers. In spite of this we only managed to gather 136 precious runs, to which Hodgson contributed 55. This total seemed hopelessly inadequate against the strong batting side of our opponents.

After a few very good introductory overs by Aubin and Hick, it became apparent that the wicket was showing signs of wear. Clappen and Haigh took over the attack and bowled unchanged for the remainder of the match.

From then on the batsmen were always in difficulty, and they were all out for 75. Clappen returned an analysis of 7—18, and Haigh's 2—37 did scant justice to his accuracy and spin.

St. Bartholomew's Hospital

D. C. Hodgson, c. W. Gould, b. Watney	55
P. B. Biddell, st. Young, b. Ferris	7
J. D. W. Tomlinson, c. W. Gould, b. Ferris	5
M. Braimbridge, c. Plumbly, b. Ferris	13
H. B. Ross, st. Young, b. Gould	11
J. A. Clappen, b. Watney	1
D. F. A. Aubin, b. Gould	2
P. G. Haigh, c. Henwood, b. Murray	14
P. D. Moyes, c. Watney, b. Henwood	2
B. D. Hick, c. Ferris, b. Henwood	1
B. N. Foy, not out	16
Extras	9

TOTAL 136

Murray 1—11; Ferris 3—22; Henwood 2—27; Gould 2—47; Watney 2—20.

Romany C.C.

P. D. R. Smith, b. Aubin	2
W. F. Gould, c. Moyes, b. Haigh	9
L. C. Henwood, c. Ross, b. Clappen	20
A. S. Nunn, st. Moyes, b. Clappen	2
J. P. Wood, st. Moyes, b. Clappen	0
G. P. Plumbly, not out	27
I. S. Ferris, c. Braimbridge, b. Haigh	9
D. N. Watney, b. Clappen	2
A. C. Gould, c. Haigh, b. Clappen	4
A. Murray, c. Ross, b. Clappen	0
A. S. Young, c. Biddell, b. Clappen	0
Extras	0

TOTAL 75

Aubin 1—17; Hick 0—3; Haigh 2—37; Clappen 7—18.

v. INCOGNITI C.C.

Played at Chislehurst on Wednesday, May 24. RESULT: Drawn.

The Incogniti batted first, and scored freely before lunch, assisted by the chilled fingers of the fielders.

Lunch restored us to life, and the opposition were dismissed for 217, eight wickets being taken by catches. This total seemed extremely formidable, particularly when our opening pair were back in the pavilion with only seven runs on the board.

Tomlinson and Braimbridge then took the precaution of playing themselves in, and the next wicket did not fall until 150 runs had been made. After this, our chief enemy was the clock, and at one minute to seven, seven runs were still needed. At the crucial moment, the bowler—not Mr. Stephen Potter—inadvertently bowled a no-ball, which prolonged the over until 7 o'clock, thus preventing another.

The match was therefore drawn, the Hospital needing six runs to win with three wickets in hand.

Incogniti :

P. Wardle, c. Moyes, b. Ross	25
H. I. Jory, c. May, b. Foy	73
R. W. Fenn, c. Tomlinson, b. Arthur	23
D. G. T. Hicks, c. Ross, b. Aubin	6
M. J. Hardy, c. Clappen, b. Aubin	2
T. C. Fort, c. Moyes, b. Aubin	6
D. M. Attwood, b. Ross	47
J. L. Rampton, c. Hodgson, b. Foy	5
M. I. A. Hunter, c. Aubin, b. Arthur	26
O. G. Battcock, not out	1
G. C. Melliush, lb.w., b. Ross	0
Extras	3

TOTAL 217

Aubin 3—29; Arthur 2—43; Clappen 0—22; Foy 2—47; Ross 3—45.

Bart's :

D. C. Hodgson, b. Fort	3
A. G. May, c. Fort, b. Battcock	0
J. D. W. Tomlinson, st. Jory, b. Hardy	74
M. Braimbridge, c. Hunter, b. Hicks	74
H. B. Ross, st. Jory, b. Hardy	15
J. A. Clappen, not out	31
D. F. A. Aubin, c. Hicks, b. Battcock	1
P. D. Moyes, c. Hardy, b. Hicks	2
B. N. Foy, B. K. Arthur, and J. S. Vazifdar did not bat.	
Extras	12

TOTAL (for 7 wks.) 212

Battcock 2—35; Fort 1—11; Hardy 2—49; Hicks 2—44; Mellhuish 0—23; R. W. Fenn 0—20.

v. R.N.V.R. C.C.

Played at Chislehurst on Sunday, May 14. RESULT: Won by five wickets.

Our opponents won the toss and decided to bat. The wicket suited the opening batsmen well, and they passed 60 without loss. However, before reaching 100, five wickets had fallen, and they were finally dismissed for 146.

Bart's had plenty of time to make the runs, our best performer being Hodgson, who scored 44. He opened the innings, and was not dismissed until victory was well within sight.

R.N.V.R. C.C. 146 (W. S. Harris 66; H. B. Ross 4—30).

St. Bartholomew's Hospital 147—6 wks. (D. C. Hodgson 44, H. B. Ross 37 n.o.).

v. CROFTON PARK

Played at Chislehurst on Saturday, May 27.
RESULT: Drawn (rain stopped play).

Crofton Park 121—7 dec. (L. G. Bishop 85).

St. Bartholomew's Hospital 44—2.

v. STANMORE C.C.

Played at Stanmore on Sunday, May 28.
RESULT: Won by 73 runs.

As usual, we were favoured by good weather for this match, and it was played on a "sporting" wicket. All the more credit is therefore due to an innings of 73 by Clappen, which dominated our batting. He went in at a time when our total lacked that touch of respectability, and he exercised all the fieldsmen without preference—including long-on.

Stanmore ultimately had to face a total of 189 on a crumbling wicket, and they never really looked like making the runs.

The wickets were shared more or less evenly between seven bowlers, and the last wicket fell with their total at 116.

St. Bartholomew's Hospital 189 (J. A. Clappen 73).

Stanmore C.C. 116.

v. BALLIOL COLLEGE, OXFORD

Played at Oxford on Saturday, June 3. **RESULT:** Won by six wickets.

Balliol College 115 (C. E. Elliott 37; B. K. Arthur 4—22, B. N. Foy 4—22).

St. Bartholomew's Hospital 116—4 (A. G. May 41 n.o., J. P. Waterhouse 31 n.o.).

v. OLD ALLEYNANS

Played at Dulwich on Sunday, June 4. **RESULT:** Won by 114 runs.

St. Bartholomew's Hospital 181—8 wks. dec. (H. B. Ross 53, P. G. Haigh 40).

Old Alleynians 67 (B. N. Foy 6—20).

RUGBY CLUB**Officials for 1950-51**

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GOLF CLUB**May 10, v. City of London Police**

In a four-ball foursome match at Old Fold Manor Golf Course, Barnet, the side defeated the City of London Police by 3 matches to 1.

RESULTS

L. R. Gracey and D. H. Rushton beat Salmon and Branch 4 and 3; C. J. R. Elliott and J. S. Dodge beat Dollonay and Martin 2 and 1; J. Bowman and G. Greenhalgh beat Purchase and Latchford 2 up; R. Dreaper and J. P. Waterhouse lost to Wood and Miller 2 down.

Staff Match—Denham

On May 17th at Denham, once again the staff entertained the students to lunch, tea and a delightful day of golf. Battle, in the form of singles, was joined soon after lunch, the students producing a convincing victory of 8 points to 4. This was not

the case in the evening, for a hurried tea, followed by its inevitable trail of dyspepsia, allowed our more seasoned elders to halve the foursomes with their rapidly tiring opponents.

Highlights of the day were L. R. Gracey's fine dash for victory at the 18th over Dr. McIlroy, and Dr. J. W. Platt, who astonished everyone and improved on his already outstanding record, by driving into the woods on the 17th for the fifth successive year.

RESULTS

Singles: L. R. Gracey beat Dr. M. B. McIlroy 1 up; R. V. Fiddian beat Prof. L. P. Garrod 4 and 3; D. H. Rushton beat Mr. G. T. Hankey 4 and 2; Dr. H. Giles halved with M. Braimbridge; J. Bowman beat Dr. G. Graham 1 up; C. Elliott beat Dr. J. W. Platt 9 and 8; Dr. R. A. Shooter beat M. Cassels 9 and 7; R. E. Dreaper beat Dr. H. F. Brewer 5 and 4; G. Greenhalgh beat Dr. G. W. Hayward 2 up; Dr. H. Morgan beat J. S. Dodge 8 and 7; Dr. F. Knott halved with A. B. Lodge; Dr. M. B. Terry beat D. L. Hodgson and J. Montagnon 2 and 1.

Foursomes: L. R. Gracey and R. V. Fiddian beat Dr. M. B. McIlroy and Prof. L. P. Garrod 3 and 1; Mr. G. T. Hankey and Dr. H. Giles beat D. H. Rushton and M. Braimbridge 2 and 1; J. Bowman and C. Elliott beat Dr. G. Graham and Dr. J. W. Platt 1 up; Dr. R. A. Shooter and Dr. H. V. Morgan beat J. S. Dodge and M. Cassels 4 and 3; R. E. Dreaper and G. Greenhalgh beat Dr. H. Brewer and Dr. G. Hayward 1 up; Dr. F. Knott and Dr. M. B. Terry beat D. L. Hodgson, J. Montagnon and A. B. Lodge 2 and 1.

ATHLETIC CLUB

The 1950 season opened fairly successfully, and to date we have had five fixtures, together with the University Championships.

We welcome all new members to the Club; response has been good, and prospects for the future, when our clinical men leave, are good. The Ladies' A.C. has made a very successful appearance, while the captain, Helen Merridith, and M. Bott, have already figured prominently for U.L.A.C.

Our first fixture was against Cambridge Harriers and Guy's Hospital. We were beaten by the former, but were ahead of Guy's.

On May 17 we entertained Shaftesbury Harriers at Chislehurst, and after a very thrilling match, in which J. A. Stainton-Ellis was kept busy running a 100 yds., 1 mile and 880 yds., we won by two points.

Results

100 yds.: 1st, B. D. Lascelles (Time 10.6 secs.); 3rd, J. A. Stainton-Ellis.

220 yds.: 2nd, B. D. Lascelles.

440 yds.: 1st, A. H. Macdonald (Time 53.0 secs.); 3rd, B. R. Wheeler.

880 yds.: 1st, A. E. Dormer (Time 2-6.0).

1 mile: 1st, J. A. Stainton-Ellis (Time 4-49.2).

Shot: 1st, D. Craggs (Distance 34ft. 9in.); 2nd, N. Khurshid.

Discus: 1st, N. Khurshid (Distance 90ft. 3in.); 2nd, D. Craggs.

Javelin: 1st, G. Middleton (Distance 110ft.).

High Jump: 3rd, D. M. Stainton-Ellis.

Long Jump: 2nd, H. Poirier.

Bart.'s won: 34—32.

Against King's and Battersea, we were somewhat weak and consequently were beaten rather badly. However, in our next match against Westminster Bank and Orion Harriers we were victors.

Results

220 relay: 1st, Bart's.
880 yds.: 1st, J. A. Stainton-Ellis (Time 2-3.0).
1 mile: 2nd, J. A. Stainton-Ellis.
High jump: 1st, H. Poirier (5ft. 2in.).
Long jump: 1st, B. D. Lascelles (18ft. 5in.).
Shot: 1st, D. Bee (36ft. 6in.); 2nd, D. Craggs.
Discus: 1st, D. Bee (95ft. 6in.).
Javelin: 1st, D. Bee (141ft. 1in.); 2nd, G. Middleton.
Bart's won: 27, 24, 13.

University Championships, Mootspur Park. May 14

We entered a strong team in this championship, had quite a few finalists, and retained our position of third in the competition. Arthur Wint won both the half and quarter mile, breaking the latter record. The Ladies again figured prominently, and were fifth in their section.

Scoring positions in the finals were gained as follows:—

80 metres hurdles, women:
440 yds., women: 2nd, M. Bott.
880 yds., women: 2nd, M. Bott.
Throwing the hammer: 1st, R. T. Heylings.
1 mile walk: 5th, G. Wallace.
440 yds.: 1st, A. S. Wint (49.8 secs., record);
3rd, A. H. Macdonald.

880 yds.: 1st, A. S. Wint (1-57.4); 2nd, A. H. Macdonald.

1 mile: 2nd, A. E. Dormer.

120 yds. hurdles: 4th, E. M. Rosser.

440 yds. hurdles: 3rd, E. M. Rosser.

Weight: 1st, D. L. Bee.

Hop, step, and jump: 4th, A. H. John.

Six of Bart's athletes—Wint, Heylings, Dormer, Rosser, Bee and Macdonald, have represented London University, while the Hospital were very prominent in helping U.L.A.C. obtain second place in the U.A.U. British Universities' Championships at the White City on May 19th.

Bart's men were:

440 yds.: 1st, A. S. Wint (48.4, record).

880 yds.: 1st, A. H. Macdonald (1-57.8); 3rd, A. E. Dormer.

Hammer: 5th, R. T. Heylings.

440 yds., women: 2nd, M. Bott.

880 yds., women: 1st, M. Bott.

80 metres hurdles: 3rd, H. Meredith.

It is significant that at the start of the London v. Paris University match, a Bart's Shield was presented to Paris University by U.L.A.C. in exchange for a Paris flag.

We look forward to the United Hospitals' Championships, being held this year at Mootspur Park on June 10, and are hoping for a good turnout on Sports Day the following Saturday.

The Club offers its congratulations to its last years' skipper, Ian Burn, on having passed his Finals. We wish him luck, and shall find him a big loss.

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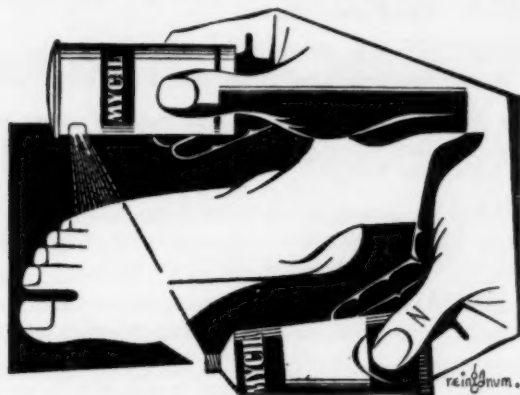
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